

## GLASS PASSIVAED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

### Features

- ◆ 500w peak pulse power capability
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0v to VBR for unidirectional and 5.0ns for bidirectional
- ◆ types. High temperature soldering guaranteed: 265°C /10S/9.5mm lead length at 5 lbs tension

### DO-15



Dimensions in inches and (millimeters)

### Maximum Ratings And Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase half-wave 60Hz, resistive or inductive load, for capacitive load current derate by 20%.

|                                                                                  | SYMBOLS                           | VALUE        | UNITS |
|----------------------------------------------------------------------------------|-----------------------------------|--------------|-------|
| Peak power dissipation                                                           | P <sub>ppm</sub>                  | Minimum 500  | W     |
| Peak pulse reverse current                                                       | I <sub>PPM</sub>                  | See Table 1  | A     |
| Steady state power dissipation (Note 2)                                          | P <sub>M(AV)</sub>                | 1.6          | W     |
| Peak forward surge current                                                       | I <sub>FSM</sub>                  | 70           | A     |
| Maximum instantaneous forward voltage at 35A<br>for unidirectional only (Note 3) | V <sub>F</sub>                    | 3.5          | V     |
| Operating junction and storage temperature range                                 | T <sub>STG</sub> , T <sub>J</sub> | -55 to + 175 | °C    |

#### Notes:

1. 10/1000μs waveform non-repetitive current pulse, per Fig.3 and derated above T<sub>a</sub>=25 °C per Fig.2
2. T<sub>L</sub>=75°C, lead lengths 9.5mm, Mounted on copper pad area of (40x40mm) Fig.5
3. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.

## ELECTRICAL CHARACTERISTICS (at TA=25 C unless otherwise noted)

| Device Type | Breakdown Voltage<br>V <sub>(BR)</sub><br>(Volts)(NOTES 1) |       | Test<br>Current<br>I <sub>T</sub> (mA) | Stand-off<br>Voltage<br>V <sub>WM</sub><br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at V <sub>WM</sub><br>I <sub>D</sub> (NOTE3)(μA) | Maximum<br>Peak Pulse<br>Reverse Current<br>I <sub>PPM</sub> (NOTE2)<br>(Amps) | Maximum<br>Clamping<br>Voltage at<br>I <sub>PPM</sub><br>V <sub>C</sub> (Volts) | Maximum<br>Temperature<br>Coefficient<br>of V <sub>(BR)</sub><br>(mv/ °C) |
|-------------|------------------------------------------------------------|-------|----------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------|
|             | MIN                                                        | MAX   |                                        |                                                    |                                                                                   |                                                                                |                                                                                 |                                                                           |
| SA5.0A      | 6.40                                                       | 7.00  | 10                                     | 5.0                                                | 600                                                                               | 54.3                                                                           | 9.2                                                                             | 5.0                                                                       |
| SA5.0CA     | 6.40                                                       | 7.00  | 10                                     | 5.0                                                | 600                                                                               | 54.3                                                                           | 9.2                                                                             | 5.0                                                                       |
| SA6.0A      | 6.67                                                       | 7.37  | 10                                     | 6.0                                                | 600                                                                               | 48.5                                                                           | 10.3                                                                            | 5.0                                                                       |
| SA6.0CA     | 6.67                                                       | 7.37  | 10                                     | 6.0                                                | 600                                                                               | 48.5                                                                           | 10.3                                                                            | 5.0                                                                       |
| SA6.5A      | 7.22                                                       | 7.98  | 10                                     | 6.5                                                | 400                                                                               | 44.7                                                                           | 11.2                                                                            | 5.0                                                                       |
| SA6.5CA     | 7.22                                                       | 7.98  | 10                                     | 6.5                                                | 400                                                                               | 44.7                                                                           | 11.2                                                                            | 5.0                                                                       |
| SA7.0A      | 7.78                                                       | 8.60  | 10                                     | 7.0                                                | 150                                                                               | 41.7                                                                           | 12.0                                                                            | 6.0                                                                       |
| SA7.0CA     | 7.78                                                       | 8.60  | 10                                     | 7.0                                                | 150                                                                               | 41.7                                                                           | 12.0                                                                            | 6.0                                                                       |
| SA7.5A      | 8.33                                                       | 9.21  | 1.0                                    | 7.5                                                | 50                                                                                | 38.8                                                                           | 12.9                                                                            | 7.0                                                                       |
| SA7.5CA     | 8.33                                                       | 9.21  | 1.0                                    | 7.5                                                | 50                                                                                | 38.8                                                                           | 12.9                                                                            | 7.0                                                                       |
| SA8.0A      | 8.89                                                       | 9.83  | 1.0                                    | 8.0                                                | 25                                                                                | 36.8                                                                           | 13.6                                                                            | 7.0                                                                       |
| SA8.0CA     | 8.89                                                       | 9.83  | 1.0                                    | 8.0                                                | 25                                                                                | 36.8                                                                           | 13.6                                                                            | 7.0                                                                       |
| SA8.5A      | 9.44                                                       | 10.40 | 1.0                                    | 8.5                                                | 10                                                                                | 34.7                                                                           | 14.4                                                                            | 8.0                                                                       |
| SA8.5CA     | 9.44                                                       | 10.40 | 1.0                                    | 8.5                                                | 10                                                                                | 34.7                                                                           | 14.4                                                                            | 8.0                                                                       |
| SA9.0A      | 10.00                                                      | 11.10 | 1.0                                    | 9.0                                                | 5.0                                                                               | 32.5                                                                           | 15.4                                                                            | 9.0                                                                       |
| SA9.0CA     | 10.00                                                      | 11.10 | 1.0                                    | 9.0                                                | 5.0                                                                               | 32.5                                                                           | 15.4                                                                            | 9.0                                                                       |
| SA10A       | 11.10                                                      | 12.30 | 1.0                                    | 10.00                                              | 1.0                                                                               | 29.4                                                                           | 17.0                                                                            | 10.0                                                                      |
| SA10CA      | 11.10                                                      | 12.30 | 1.0                                    | 10.00                                              | 1.0                                                                               | 29.4                                                                           | 17.0                                                                            | 10.0                                                                      |
| SA11A       | 12.20                                                      | 13.50 | 1.0                                    | 11.00                                              | 1.0                                                                               | 27.5                                                                           | 18.2                                                                            | 11.0                                                                      |
| SA11CA      | 12.20                                                      | 13.50 | 1.0                                    | 11.00                                              | 1.0                                                                               | 27.5                                                                           | 18.2                                                                            | 11.0                                                                      |
| SA12A       | 13.30                                                      | 14.70 | 1.0                                    | 12.00                                              | 1.0                                                                               | 25.1                                                                           | 19.9                                                                            | 12.0                                                                      |
| SA12CA      | 13.30                                                      | 14.70 | 1.0                                    | 12.00                                              | 1.0                                                                               | 25.1                                                                           | 19.9                                                                            | 12.0                                                                      |
| SA13A       | 14.40                                                      | 15.90 | 1.0                                    | 13.00                                              | 1.0                                                                               | 23.3                                                                           | 21.5                                                                            | 13.0                                                                      |
| SA13CA      | 14.40                                                      | 15.90 | 1.0                                    | 13.00                                              | 1.0                                                                               | 23.3                                                                           | 21.5                                                                            | 13.0                                                                      |
| SA14A       | 15.60                                                      | 17.20 | 1.0                                    | 14.00                                              | 1.0                                                                               | 21.6                                                                           | 23.2                                                                            | 14.0                                                                      |
| SA14CA      | 15.60                                                      | 17.20 | 1.0                                    | 14.00                                              | 1.0                                                                               | 21.6                                                                           | 23.2                                                                            | 14.0                                                                      |
| SA15A       | 16.70                                                      | 18.50 | 1.0                                    | 15.00                                              | 1.0                                                                               | 20.5                                                                           | 24.4                                                                            | 16.0                                                                      |
| SA15CA      | 16.70                                                      | 18.50 | 1.0                                    | 15.00                                              | 1.0                                                                               | 20.5                                                                           | 24.4                                                                            | 16.0                                                                      |
| SA16A       | 17.80                                                      | 19.70 | 1.0                                    | 16.00                                              | 1.0                                                                               | 19.2                                                                           | 26.0                                                                            | 17.0                                                                      |
| SA16CA      | 17.80                                                      | 19.70 | 1.0                                    | 16.00                                              | 1.0                                                                               | 19.2                                                                           | 26.0                                                                            | 17.0                                                                      |
| SA17A       | 18.90                                                      | 20.90 | 1.0                                    | 17.00                                              | 1.0                                                                               | 18.1                                                                           | 27.6                                                                            | 19.0                                                                      |
| SA17CA      | 18.90                                                      | 20.90 | 1.0                                    | 17.00                                              | 1.0                                                                               | 18.1                                                                           | 27.6                                                                            | 19.0                                                                      |
| SA18A       | 20.00                                                      | 22.10 | 1.0                                    | 18.00                                              | 1.0                                                                               | 17.1                                                                           | 29.2                                                                            | 20.0                                                                      |
| SA18CA      | 20.00                                                      | 22.10 | 1.0                                    | 18.00                                              | 1.0                                                                               | 17.1                                                                           | 29.2                                                                            | 20.0                                                                      |
| SA20A       | 22.20                                                      | 24.50 | 1.0                                    | 20.00                                              | 1.0                                                                               | 15.4                                                                           | 32.4                                                                            | 23.0                                                                      |
| SA20CA      | 22.20                                                      | 24.50 | 1.0                                    | 20.00                                              | 1.0                                                                               | 15.4                                                                           | 32.4                                                                            | 23.0                                                                      |
| SA22A       | 24.40                                                      | 26.90 | 1.0                                    | 22.00                                              | 1.0                                                                               | 14.1                                                                           | 35.5                                                                            | 25.0                                                                      |
| SA22CA      | 24.40                                                      | 26.90 | 1.0                                    | 22.00                                              | 1.0                                                                               | 14.1                                                                           | 35.5                                                                            | 25.0                                                                      |
| SA24A       | 26.70                                                      | 29.50 | 1.0                                    | 24.00                                              | 1.0                                                                               | 12.9                                                                           | 38.9                                                                            | 28.0                                                                      |
| SA24CA      | 26.70                                                      | 29.50 | 1.0                                    | 24.00                                              | 1.0                                                                               | 12.9                                                                           | 38.9                                                                            | 28.0                                                                      |
| SA26A       | 28.90                                                      | 31.90 | 1.0                                    | 26.00                                              | 1.0                                                                               | 11.9                                                                           | 42.1                                                                            | 30.0                                                                      |
| SA26CA      | 28.90                                                      | 31.90 | 1.0                                    | 26.00                                              | 1.0                                                                               | 11.9                                                                           | 42.1                                                                            | 30.0                                                                      |
| SA28A       | 31.10                                                      | 34.40 | 1.0                                    | 28.00                                              | 1.0                                                                               | 11.0                                                                           | 45.4                                                                            | 31.0                                                                      |
| SA28CA      | 31.10                                                      | 34.40 | 1.0                                    | 28.00                                              | 1.0                                                                               | 11.0                                                                           | 45.4                                                                            | 31.0                                                                      |
| SA30A       | 33.30                                                      | 36.80 | 1.0                                    | 30.00                                              | 1.0                                                                               | 10.0                                                                           | 48.4                                                                            | 36.0                                                                      |
| SA30CA      | 33.30                                                      | 36.80 | 1.0                                    | 30.00                                              | 1.0                                                                               | 10.0                                                                           | 48.4                                                                            | 36.0                                                                      |
| SA33A       | 36.70                                                      | 40.60 | 1.0                                    | 33.00                                              | 1.0                                                                               | 9.4                                                                            | 53.3                                                                            | 39.0                                                                      |
| SA33CA      | 36.70                                                      | 40.60 | 1.0                                    | 33.00                                              | 1.0                                                                               | 9.4                                                                            | 53.3                                                                            | 39.0                                                                      |

The electrical characteristics above is for reference only.

## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Device Type | Breakdown Voltage<br>V <sub>(BR)</sub><br>(Volts)(NOTES 1) |        | Test<br>Current<br>I <sub>T</sub> (mA) | Stand-off<br>Voltage<br>V <sub>WM</sub><br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at V <sub>WM</sub><br>I <sub>D</sub> (NOTE3)(μA) | Maximum<br>Peak Pulse<br>Reverse Current<br>I <sub>PPM</sub> (NOTE2)<br>(Amps) | Maximum<br>Clamping<br>Voltage at<br>I <sub>PPM</sub><br>V <sub>C</sub> (Volts) | Maximum<br>Temperature<br>Coefficient<br>of V <sub>(BR)</sub><br>(mv/°C) |
|-------------|------------------------------------------------------------|--------|----------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|             | MIN                                                        | MAX    |                                        |                                                    |                                                                                   |                                                                                |                                                                                 |                                                                          |
| SA36A       | 40.00                                                      | 44.20  | 1.0                                    | 36.00                                              | 1.0                                                                               | 58.1                                                                           | 8.6                                                                             | 41.0                                                                     |
| SA36CA      | 40.00                                                      | 44.20  | 1.0                                    | 36.00                                              | 1.0                                                                               | 58.1                                                                           | 8.6                                                                             | 41.0                                                                     |
| SA40A       | 44.40                                                      | 49.10  | 1.0                                    | 40.00                                              | 1.0                                                                               | 64.5                                                                           | 7.8                                                                             | 46.0                                                                     |
| SA40CA      | 44.40                                                      | 49.10  | 1.0                                    | 40.00                                              | 1.0                                                                               | 64.5                                                                           | 7.8                                                                             | 46.0                                                                     |
| SA43A       | 47.80                                                      | 52.80  | 1.0                                    | 43.00                                              | 1.0                                                                               | 69.4                                                                           | 7.2                                                                             | 50.0                                                                     |
| SA43CA      | 47.80                                                      | 52.80  | 1.0                                    | 43.00                                              | 1.0                                                                               | 69.4                                                                           | 7.2                                                                             | 50.0                                                                     |
| SA45A       | 50.00                                                      | 55.30  | 1.0                                    | 45.00                                              | 1.0                                                                               | 72.7                                                                           | 6.9                                                                             | 52.0                                                                     |
| SA45CA      | 50.00                                                      | 55.30  | 1.0                                    | 45.00                                              | 1.0                                                                               | 72.7                                                                           | 6.9                                                                             | 52.0                                                                     |
| SA48A       | 53.30                                                      | 58.90  | 1.0                                    | 48.00                                              | 1.0                                                                               | 77.4                                                                           | 6.5                                                                             | 56.0                                                                     |
| SA48CA      | 53.30                                                      | 58.90  | 1.0                                    | 48.00                                              | 1.0                                                                               | 77.4                                                                           | 6.5                                                                             | 56.0                                                                     |
| SA51A       | 56.70                                                      | 62.70  | 1.0                                    | 51.00                                              | 1.0                                                                               | 82.4                                                                           | 6.1                                                                             | 61.0                                                                     |
| SA51CA      | 56.70                                                      | 62.70  | 1.0                                    | 51.00                                              | 1.0                                                                               | 82.4                                                                           | 6.1                                                                             | 61.0                                                                     |
| SA54A       | 60.00                                                      | 66.30  | 1.0                                    | 54.00                                              | 1.0                                                                               | 87.1                                                                           | 5.7                                                                             | 65.0                                                                     |
| SA54CA      | 60.00                                                      | 66.30  | 1.0                                    | 54.00                                              | 1.0                                                                               | 87.1                                                                           | 5.7                                                                             | 65.0                                                                     |
| SA58A       | 64.40                                                      | 71.20  | 1.0                                    | 58.00                                              | 1.0                                                                               | 93.6                                                                           | 5.3                                                                             | 70.0                                                                     |
| SA58CA      | 64.40                                                      | 71.20  | 1.0                                    | 58.00                                              | 1.0                                                                               | 93.6                                                                           | 5.3                                                                             | 70.0                                                                     |
| SA60A       | 66.70                                                      | 73.70  | 1.0                                    | 60.00                                              | 1.0                                                                               | 96.8                                                                           | 5.2                                                                             | 71.0                                                                     |
| SA60CA      | 66.70                                                      | 73.70  | 1.0                                    | 60.00                                              | 1.0                                                                               | 96.8                                                                           | 5.2                                                                             | 71.0                                                                     |
| SA64A       | 71.10                                                      | 78.60  | 1.0                                    | 64.00                                              | 1.0                                                                               | 103.0                                                                          | 4.9                                                                             | 76.0                                                                     |
| SA64CA      | 71.10                                                      | 78.60  | 1.0                                    | 64.00                                              | 1.0                                                                               | 103.0                                                                          | 4.9                                                                             | 76.0                                                                     |
| SA70A       | 77.80                                                      | 86.00  | 1.0                                    | 70.00                                              | 1.0                                                                               | 113.0                                                                          | 4.4                                                                             | 85.0                                                                     |
| SA70CA      | 77.80                                                      | 86.00  | 1.0                                    | 70.00                                              | 1.0                                                                               | 113.0                                                                          | 4.4                                                                             | 85.0                                                                     |
| SA75A       | 83.30                                                      | 92.10  | 1.0                                    | 75.00                                              | 1.0                                                                               | 121.0                                                                          | 4.1                                                                             | 91.0                                                                     |
| SA75CA      | 83.30                                                      | 92.10  | 1.0                                    | 75.00                                              | 1.0                                                                               | 121.0                                                                          | 4.1                                                                             | 91.0                                                                     |
| SA78A       | 86.70                                                      | 95.80  | 1.0                                    | 78.00                                              | 1.0                                                                               | 126.0                                                                          | 4.0                                                                             | 95.0                                                                     |
| SA78CA      | 86.70                                                      | 95.80  | 1.0                                    | 78.00                                              | 1.0                                                                               | 126.0                                                                          | 4.0                                                                             | 95.0                                                                     |
| SA85A       | 94.40                                                      | 104.00 | 1.0                                    | 85.00                                              | 1.0                                                                               | 137.0                                                                          | 3.6                                                                             | 103                                                                      |
| SA85CA      | 94.40                                                      | 104.00 | 1.0                                    | 85.00                                              | 1.0                                                                               | 137.0                                                                          | 3.6                                                                             | 103                                                                      |
| SA90A       | 100.00                                                     | 111.00 | 1.0                                    | 90.00                                              | 1.0                                                                               | 146.0                                                                          | 3.4                                                                             | 111                                                                      |
| SA90CA      | 100.00                                                     | 111.00 | 1.0                                    | 90.00                                              | 1.0                                                                               | 146.0                                                                          | 3.4                                                                             | 111                                                                      |
| SA100A      | 111.00                                                     | 123.00 | 1.0                                    | 100.00                                             | 1.0                                                                               | 162.0                                                                          | 3.1                                                                             | 123                                                                      |
| SA100CA     | 111.00                                                     | 123.00 | 1.0                                    | 100.00                                             | 1.0                                                                               | 162.0                                                                          | 3.1                                                                             | 123                                                                      |
| SA110A      | 122.00                                                     | 135.00 | 1.0                                    | 110.00                                             | 1.0                                                                               | 177.0                                                                          | 2.8                                                                             | 133                                                                      |
| SA110CA     | 122.00                                                     | 135.00 | 1.0                                    | 110.00                                             | 1.0                                                                               | 177.0                                                                          | 2.8                                                                             | 133                                                                      |
| SA120A      | 133.00                                                     | 147.00 | 1.0                                    | 120.00                                             | 1.0                                                                               | 193.0                                                                          | 2.6                                                                             | 146                                                                      |
| SA120CA     | 133.00                                                     | 147.00 | 1.0                                    | 120.00                                             | 1.0                                                                               | 193.0                                                                          | 2.6                                                                             | 146                                                                      |
| SA130A      | 144.00                                                     | 159.00 | 1.0                                    | 130.00                                             | 1.0                                                                               | 209.0                                                                          | 2.4                                                                             | 158                                                                      |
| SA130CA     | 144.00                                                     | 159.00 | 1.0                                    | 130.00                                             | 1.0                                                                               | 209.0                                                                          | 2.4                                                                             | 158                                                                      |
| SA150A      | 167.00                                                     | 185.00 | 1.0                                    | 150.00                                             | 1.0                                                                               | 243.0                                                                          | 2.1                                                                             | 184                                                                      |
| SA150CA     | 167.00                                                     | 185.00 | 1.0                                    | 150.00                                             | 1.0                                                                               | 243.0                                                                          | 2.1                                                                             | 184                                                                      |
| SA160A      | 178.00                                                     | 197.00 | 1.0                                    | 160.00                                             | 1.0                                                                               | 259.0                                                                          | 1.9                                                                             | 196                                                                      |
| SA160CA     | 178.00                                                     | 197.00 | 1.0                                    | 160.00                                             | 1.0                                                                               | 259.0                                                                          | 1.9                                                                             | 196                                                                      |
| SA170A      | 189.00                                                     | 209.00 | 1.0                                    | 170.00                                             | 1.0                                                                               | 275.0                                                                          | 1.8                                                                             | 208                                                                      |
| SA170CA     | 189.00                                                     | 209.00 | 1.0                                    | 170.00                                             | 1.0                                                                               | 275.0                                                                          | 1.8                                                                             | 208                                                                      |

### NOTES:

1. V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300μs, I<sub>T</sub>=square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35
5. For parts without A, the V<sub>BR</sub> is ± 10% and V<sub>C</sub> is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

The electrical characteristics above is for reference only.

FIG. 1-PEAK PULSE POWER RATING CURVE

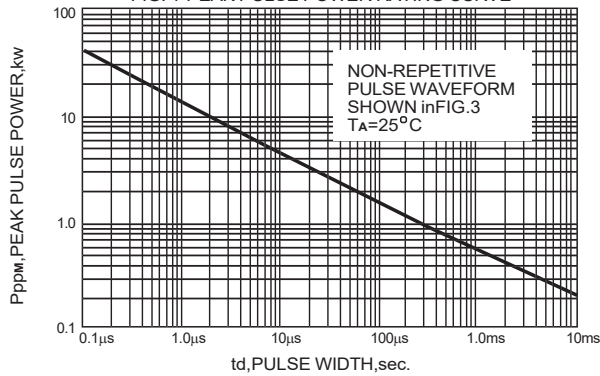


FIG. 3-PULSE WAVEFORM

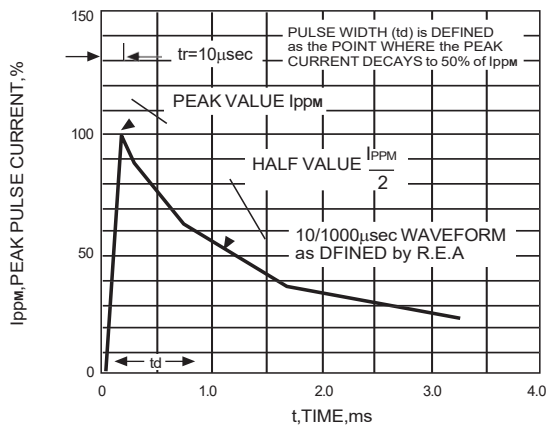


FIG. 5-STEADY STATE POWER DERATING CURVE

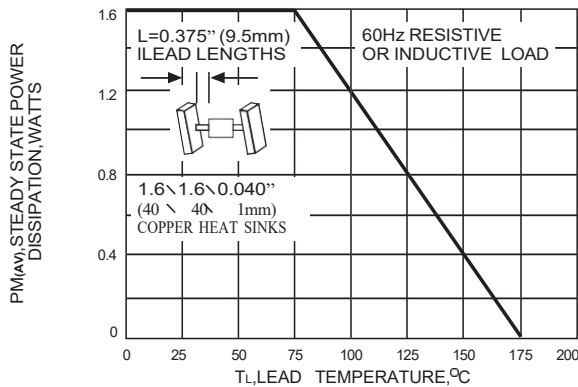


FIG. 7-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

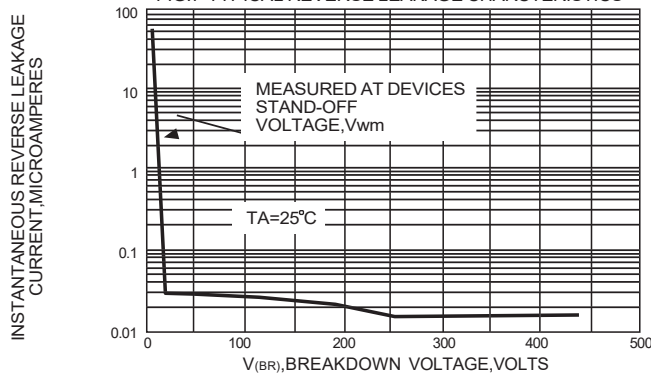


FIG. 2-PULSE DERATING CURVE

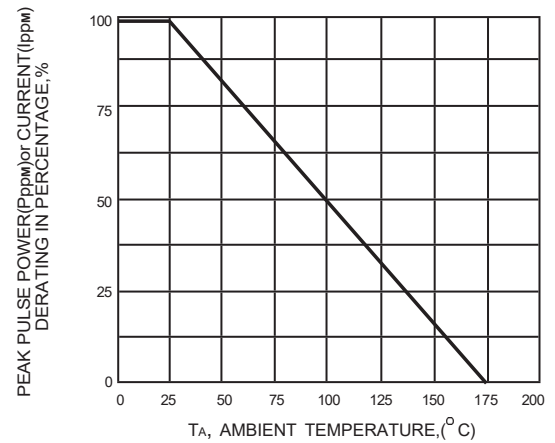


FIG. 4-TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

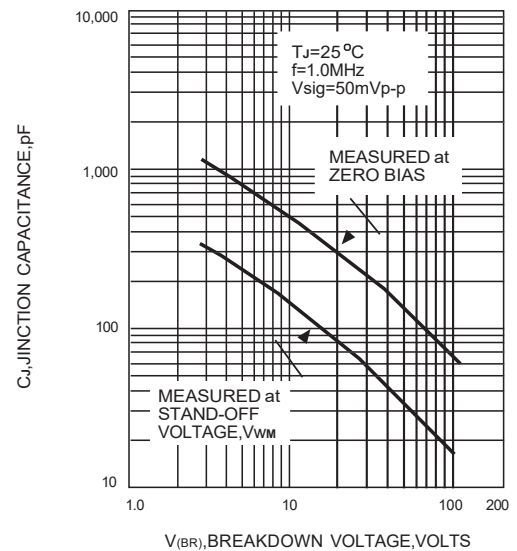
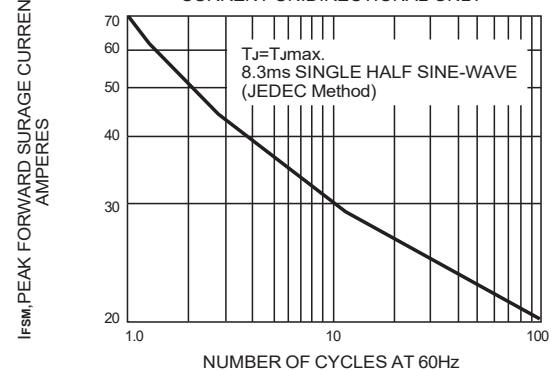


FIG. 6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY



The curve characteristics above is for reference only.